Figure 5.13-7 146th Street – Folded Diamond Interchange Option: Aerial view looking south

Current

Proposed

Figure 5.13-8 146th Street -Tight Diamond Urban Interchange Option: Aerial view looking south

Current

Proposed

Figure 5.13-9 SR 32 Interchange: Aerial view looking south

Current

Proposed

Figure 5.13-10 SR 32 Interchange: Ground view looking west

Current

Proposed

Figure 5.13-11 Alternative G SR 32 Interchange: Aerial view looking north

Current

Proposed

5.14 Hazardous Materials Sites

Hazardous Materials Sites located within the project area were identified (Appendix A). The No-Action Alternative would incur no impacts to known hazardous materials sites. While 36 known underground storage tank (UST) facilities, leaking UST (LUST) incidents, and small quantity generators (SQGs) were identified within the vicinity of the build alternatives, only twelve are close to or within the proposed construction limits. Table 5.14 illustrates impacted sites for each alternative.

Table 5.14-1
Potentially Impacted Hazardous Materials Sites

ID*	Alts.	Type & ID #	Location	Concerns
1	F & G	SQG – 1000841370 LUST – 1000751632 UST - none	9601 North Meridian Street	Abandoned gas station, Shell Oil Co., building razed. Located monitoring wells and abandoned well. Listed as SQG, LUST site and UST site.
2	F & G	LUST – U001077316 UST – none	9602 North Meridian Street	Abandoned gas station, SS #10044, building razed. Located monitoring wells, soil borings, abandoned wells and abandoned recovery wells. Appears UST system was removed. Listed as LUST and UST site.
4	F & G	SQG – 1000907848 LUST – not reported UST – none	10101 North Meridian Street	Tutweiler Cadillac Peugeot Inc., car dealership and repair shop, SQG, LUST site and UST site.
15	F & G	SQG – not reported	Circle Drive/US31 Intersection	J & F furniture stripping and refinishing located on northwest corner.
17	F & G	UST – U001082643	1032 North Rangeline Road	Speedway Unit #5468, registered UST facility. Additionally, this facility is a former Phillips 66 Station.
25	F	UST – 1000508200	NW corner of US 31 and 169th Street	Sakrete of Indiana, Inc., bagging facility, UST.
27	F	LUST – U001959092 UST – not reported	17300 US 31 North	Truss Manufacturing Co., LUST and UST site.
28	F	LUST – U001078677 UST – not reported	SR32/US31 Intersection	Marathon gas station located on southeast corner, pump islands, USTs and monitoring wells.
29	F	LUST – U003094076 UST – not reported	SR32/US31 Intersection	Gas America gas station located on northeast corner pump islands and USTs. (orphan site)
30	F	Potential UST facility	SR32/US31 Intersection	Taco Bell on northwest corner of intersection is former gas station. Probability of USTs.
31	F	Potential UST facility	North Side SR 32 West of US 31	Abandoned gas station and restaurant, former tank fields observed on east side of building. USTs may be present on the property.
36	F & G	UST facility	216th Street/US 31 Intersection	Gas Station located on southeast corner of intersection, UST facility.

*- Relates to Appendix A

Alternatives F1 through F6 would impact twelve sites, where Alternatives G1 through G6 would impact only six sites. For Alternatives F1 through F6, all but one (Site 15) has a UST concern. Six of these have reported releases (LUST incidents). The six sites impacted by Alternatives G1 through G6 are impacted by Alternatives F1 through F6 as well. Alternatives G1 through G6 would impact no Hazardous Materials Sites along the off-alignment portion.

A Phase II Environmental Site Assessment will be performed at any property with potential contamination prior to construction.

5.15 Energy

Transportation accounts for a major portion of both direct and indirect energy consumption in the United States. Direct energy consumption is that which is consumed by vehicles traveling on the roadways, while indirect energy consumption refers to the energy consumed during the construction and maintenance of a new facility. Energy consumption for vehicle operation and facility maintenance represents longer-term energy impacts while construction energy is typically a large, one-time energy expenditure.

Studies suggest that over half of the energy consumed for most transportation projects is operational (direct) energy, and that 42% is consumed by vehicle manufacturing and maintenance (Hatano et. al., July 1983). Therefore, transportation facility construction and maintenance typically comprises less than eight percent of the total energy consumed. This analysis estimates operational energy for long-term effects.

Long-term energy consumption is based on vehicle miles traveled (VMT), the average operating speeds, and the fuel consumption rates by type of vehicle. Forecast highway traffic volumes for the project corridor were used. Fuel consumption rates used include the energy consumed in fuel refining.

As shown in Table 5.15-1, the build alternatives are estimated to increase direct energy consumed compared to the No-Action Alternative. This magnitude of increase, however, is limited to the project corridor as evidenced by the 39% increase in build alternative ADT over the No-Action Alternative ADT. A shift of traffic to a more efficient and direct build alternative from other, more congested roads in the region would translate into a relatively small region-wide increase in average speeds and VMT. Region-wide, energy consumed would change marginally.

Table 5.15-1
Annual Operational Energy Consumption

Alternative	Annual Vehicle Miles Traveled	Average Speed, mph	Operating Energy Consumption, millions of BTUs
Existing (2000)	150,597,900	50	635,595
No-Action (2025)	185,095,560	45	745,017
F Alternatives (2025)	310,731,000	55	1,390,519
G Alternatives (2025)	331,863,000	55	1,485,084

In addition, construction of either build alternative would reduce traffic congestion and turning conflicts along U.S. 31 and, thereby, would reduce vehicular stopping and slowing conditions. The energy conservation that would result from these changed conditions is not fully reflected in this analysis because the frequency of stopping and slowing is not normally quantified.

Overall, Alternatives G1 through G6 are estimated to increase energy consumed by about seven percent over Alternatives F1 through F6. Alternatives G1 through G6 are a mile longer than

Alternatives F1 through F6, and vehicles would expend more energy traveling the additional mile.

Energy consumption by vehicles in the area may increase during construction due to possible traffic delays.

5.16 Construction Impacts

During construction activities, there are several environmental impacts that could result. These impacts could be controlled, minimized or mitigated through careful construction practices and methods. The No-Action Alternative would incur no construction impacts.

5.16.1 Drainage

Control of erosion from the construction site and retention of siltation on site are the two principal concerns of construction impacts as they relate to drainage. These impacts can be minimized through erosion and sediment control measures, otherwise known as Best Management Practices (BMPs). Using prescribed measures, erosion and sedimentation can be significantly reduced at or near the construction site. Exposure to cleared areas and erodible earth would be avoided whenever possible and feasible. These erosion and sediment control measures would become permanent feature in roadway design.

5.16.2 Water Quality and Biotic Communities

Many stream crossings are located throughout the project area. Disposition of chemicals and increased turbidity may result from construction practices within or near a stream crossing. As described in Section 5.16.1, appropriate sediment and erosion control BMPs should be implemented, whenever possible, to reduce the impacts to water resources.

5.16.3 Solid Waste Disposal

Solid waste generation resulting from construction activities should be short-term and confined to the vicinity of the project area. Solid waste generated by clearing and grubbing, demolition or other construction practices should be removed from the location and properly disposed.

Burning of construction related debris should be conducted in accordance with all local, state and federal regulations. All burning would be conducted within a reasonable distance from all homes and care will be taken to alleviate any potential atmospheric conditions that may be a hazard to the public. All burning would be monitored.

5.16.4 Air Quality

Construction activities could have a short-term impact on air quality conditions if uncontrolled. Dust (particulates) is the pollutant of primary concern during construction activities. Smoke, as discussed in section 5.16.3, is another concern.

Dust can be generated in association with excavation and earth moving; cement, asphalt and aggregate handling; heavy equipment operation over haul roads; and wind erosion of exposed areas and materials storage piles. Local weather conditions and level of operation would play a significant role in the amount of dust generated. Appropriate dust control would be employed during construction for the protection of motorists and area residents.

Emissions from construction equipment and open burning would be regulated in accordance with appropriate state and federal regulations. During construction the contractor must comply with all federal, state, and local laws and regulations governing the control of air pollution. Adequate dust-control measures would be maintained so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause any damage to any property or business.

All bituminous and portland cement concrete proportioning plants and crushers would meet the requirements of IDEM. For any portable bituminous or concrete plant or crusher, the contractor must apply for a permit-to-install from the Permit Section, Air Quality Division, of the IDEM. Dust collectors must also be provided on all bituminous plants. Dry, fine aggregate material removed from the dryer exhaust by the dust collector must be returned to the dryer discharge unless otherwise directed by the project engineer.

5.16.5 Noise

An increase in project area noise levels would occur during the construction. Land uses that would be sensitive to vehicular noise would also be sensitive to construction noise. The actual level of noise impact during this period, however, would be a function of the number and type of equipment used, as well as the type of construction activities. This may include heavy equipment movement and grading.

Noise impacts could be controlled through the regulation of construction time and hours worked, using noise-controlled construction equipment, limitations of construction vehicles during evening and weekend hours and by locating equipment storage areas away from noise sensitive areas.

5.16.6 Traffic Maintenance

For the build alternatives, construction would cover several years and be divided in manageable subprojects projects. The number and size of these subprojects depends on many factors and would be determined in the final design stage.

In each subproject, two lanes of northbound and southbound traffic shall be maintained. Roadway construction would require two primary phases. At constructed interchanges through traffic on the crossroad would be maintained. All turning movements would be maintained, although they would be part of constructed temporary intersections. SR 431 access with US 31would be kept open to provide an option for traffic to avoid construction zones on the south part of the project.

5.17 Permits

The following Federal permits relating to terrestrial and aquatic resources may be required for the proposed project.

Agency	Permit
United States Army Corps of Engineers (USACE)	Section 404 Permit for the Discharge of Dredged or Fill Material into waters of the US (e.g.; streams and wetlands)

The following permits from the State of Indiana relating to terrestrial and aquatic resources may be required for the proposed project.

Agency	Permit
Indiana Department of Environmental Management (IDEM)	Section 401 Water Quality Certification
IDEM	National Pollutant Discharge Elimination System (NPDES)
Indiana Department of Natural Resources (IDNR)	Construction in a Floodway

The following agencies regulate a "permit by rule." Though no actual permit is issued, correspondence is required with these agencies prior to construction activities.

Agency	Permit By Rule
IDEM (facilitated by SWCD)	Storm Water runoff Associated with Construction Activity (Rule 5)
Hamilton County Drainage Board	Legal Drains (Hamilton County Code 36-9-27-17)
Westfield Utilities Department	Wellhead Protection Zone

5.18 Short-Term Use of Environment Versus Long-Term Productivity

The No-Action Alternative would incur no impacts to short-term use of the environment or long-term productivity. The implementation of a freeway alternative would result in short-term traffic delays and short-term consumption of energy and resources for approximately three to five years or until the proposed project is complete. Increased traffic congestion would occur in areas along the project area where work is being performed and construction materials are transported. Increased consumption of energy and resources would result from the production, purchase, transportation, and development of road construction materials.

Long-term productivity would supersede short-term impacts by: providing transportation improvements to accommodate existing and planned growth in population and employment in

Hamilton County; reducing traffic congestion on existing US 31; and improving safety. It can be concluded that short-term traffic congestion and the consumption of energy and resources are consistent with the maintenance and enhancement of long-term productivity for Carmel/Clay Township and Westfield/Washington Township. Long-term productivity is anticipated to be far greater than the short-term impacts associated with the proposed project.

5.19 Irreversible and Irretrievable Commitments of Resources

The No-Action Alternative would incur no commitments of resources.

The implementation of one of the highway alternatives would involve a commitment of natural, physical, and financial resources. Real property to be developed for this project would be an irreversible commitment of these resources during the time period that the land is used for a highway facility. Because of the structural nature of the highway, if a greater need for the land arises, it can be converted to another use.

Undetermined volumes of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material would be utilized for the development of the proposed project. Additionally, large amounts of labor and natural resources would be used in the fabrication and preparation of these construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse effect on continued availability of these resources. The implementation of the proposed action would require substantial initial expenditure of both state and federal funds, which are also no retrievable.

The irreversible commitment of these resources is based on the concept that residents in Carmel/Clay Township and Westfield/Washington Township and surrounding areas would benefit from the implementation of the proposed project. These benefits would consist of the provision of transportation improvements to accommodate existing and planned growth in population and employment; reduced congestion on existing US 31; and improved safety.

5.20 Indirect and Cumulative Impacts

Impacts, beyond those directly induced by the US 31 Improvement Project, have been assessed. These impacts fall into one of two categories—indirect and cumulative impacts. Indirect impacts are defined as the effects of the proposed project that occur at a different time or location of the direct impacts of the project. These are areas that are currently undeveloped and have not been identified for potential future development. Any development on these parcels would be solely in response to the project.

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR § 1508.7). These areas have been identified for future development; either site plans have been approved, the area has been identified for future development by a local planning commission, or the land has been zoned for development.

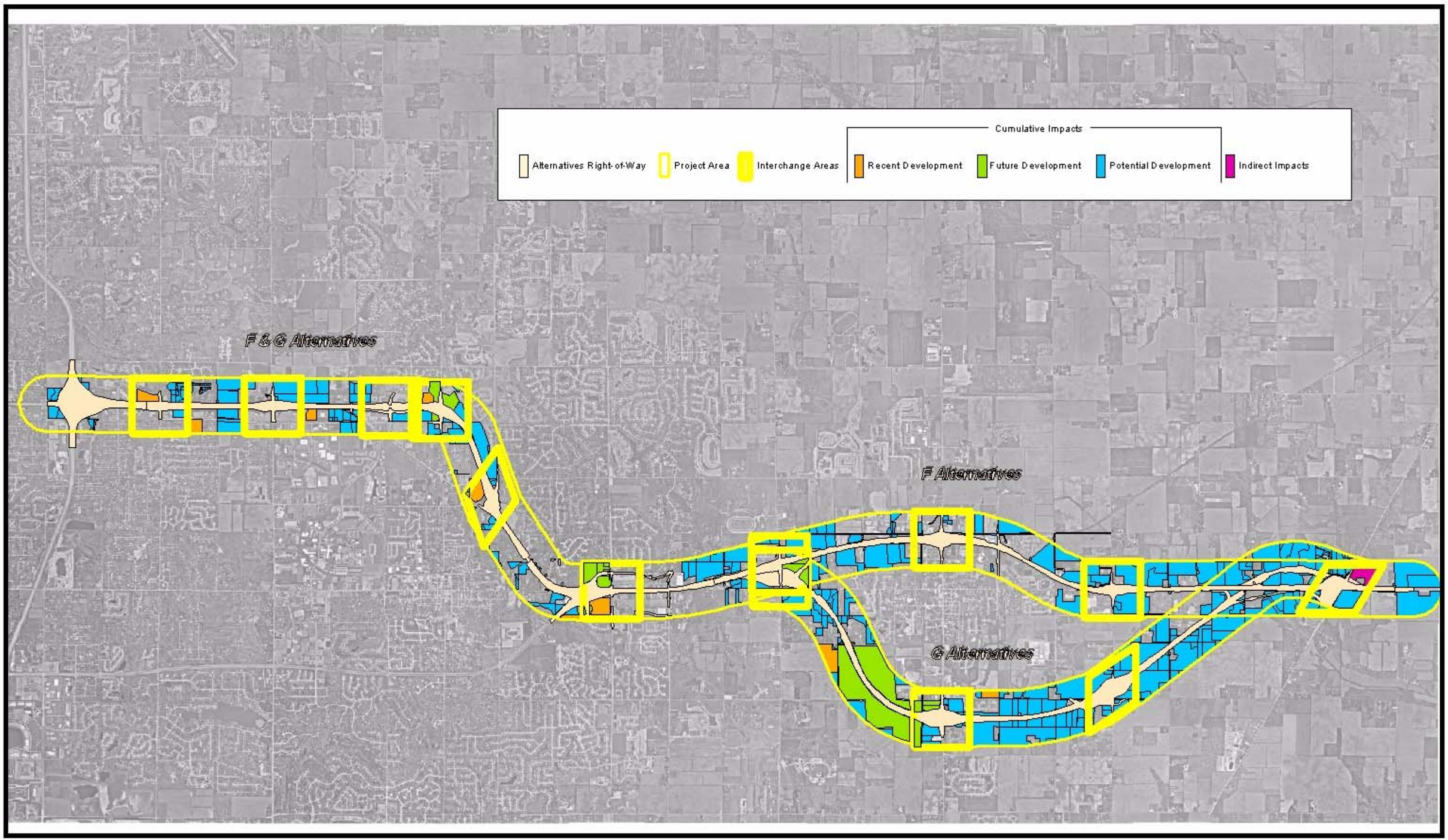
The indirect and cumulative impact analysis was completed as per methods detailed in "Considering Cumulative Effects Under the National Environmental Policy Act" (Council on Environmental Quality, January 1997), "Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects" (National Cooperative Highway Research Program Report 466, 2002), "Indirect and Cumulative Impact Assessment in the Highway Project Development Process" (FHWA Position Paper, HEP-32, April 1992), and "Consideration of Cumulative Impacts in EPA Review of NEPA Documents" (EPA 315-R-99-002, May 1999).

5.20.1 Methodology

The boundary of the study area for the impacts analysis was a one-half mile corridor, one-quarter mile off centerline, along the existing alignment and the proposed corridor of Alternative G1 and G6. The entire area of Westfield between Alternatives F1 through F6 and G1 through G6 was also included. The land use impacts associated with the US 31 Improvement Project are sufficiently contained within these boundaries. Current land uses were mapped within the study area. Land use data was cross-referenced with recent/current development, proposed development, potential future development, and transportation improvement projects. This information was mapped to graphically represent the locations of the land use and development data (Figure 5.20-1). Specific consideration was given to the areas surrounding proposed interchanges as being high potential development areas. A half-mile corridor was identified along the cross street, defining, for purposes of the analysis, the interchange area. The Indirect Impact Analysis was limited to the interchange areas, assuming that development inspired solely by the project is more likely to occur at the interchanges. Detailed development activity was analyzed for a 20-year time span, from the beginning of the project (2000) to present, and projected to 2020 (in reference to comprehensive plans). Aerial photography of the project area was analyzed for development trends along the corridor to 1941. Analysis of impacts to specific natural resources (wetlands, streams, forests, and farmland) was accomplished via trend analysis based on documented resource impacts within the study area (when available) and/or Hamilton County.

Undeveloped Parcels (Indirect): Few parcels within the study area are currently vacant *and* zoned agricultural. Impacts in these areas are considered "Indirect," influenced directly and solely by the US 31 Improvement Project in an area that is unlikely to be developed in the reasonably foreseeable future. Indirect Impacts are focused in the northern, less developed, portion of the project area.

Historic Development: Historic aerial photography was reviewed for overt development trends. The construction of US 31 as a divided highway in the 1940's from north of the project area south to approximately 146th Street opened Washington Township for progressive development. Commercial facilities began appearing near the SR 32 intersection in the 1950's. The divided highway was continued southward and connected with SR 431 in the mid 1960's. Residential developments had practically saturated the previously agricultural SR 431 corridor, by 1972. The construction of US 31, south of 146th Street, in the early 1970's, led to a significant increase in residential developments through the 1980's. The late 1980's witnessed the beginning of the commercial development trend along the US 31 corridor, which has been moderately constant to date.



US31 IMPROVEMENT PROJECT

Aerial Source: Hamilton County, Indiana

Figure 5.20-1
Indirect and Cumulative Impact Analysis

Draft Environmental Impact Statement
Hamilton County, Indiana

Recent/Current Development (Cumulative): Since the beginning of the project, many new developments have been/are being constructed. These include:

- The Heart Center of Indiana (Appendix A – Sheet 2)
- Office Building on North Pennsylvania Street (Appendix A – Sheet 2)
- Hotels on North Pennsylvania Street (Appendix A – Sheet 3)
- Hamilton Crossing, Building #5 (Appendix A – Sheets 4A and 4B)
- St. Vincent Hospital (Appendix A – Sheets 4A, 4B, and 5)
- Lowes (Appendix A – Sheets 6A, 6B, and 6C)
- SR 431 Northbound Off-ramp at 146th Street (Appendix A – Sheets 6A, 6B, and 6C)
- Oak Manor (Appendix A – Sheet 15)
- Westfield Woods Elementary School (Appendix A – Sheets 16 and 17)

Proposed Future Development (Cumulative): Extensive development of open land is already planned and approved in much of area along the existing alignment as well as along Alternatives G1 through G6 corridor. Plans for these proposed developments have been incorporated into the Environmental Features maps (Appendix A). These areas include:

- Duke Weeks, Parkwood Crossing (Appendix A – Sheet 1)
- Hamilton Crossing, Building #6 (Appendix A – Sheets 4A and 4B)
- Hilton Gardens Inn (Appendix A – Sheets 4A and 4B)
- CMC Office Development (Appendix A – Sheet 1)
- Clay Terrace (Appendix A – Sheets 6A, 6B, and 6C)
- Greyhound Commons (Appendix A – Sheets 6A, 6B, and 6C)
- Cool Creek Commons (Appendix A – Sheets 7, 8, 14, and 15)
- Oak Manor PUD (Appendix A – Sheets 15 and 16)

Potential Future Development (Cumulative): Much of the undeveloped land in the area (agriculture, pasture, wooded, etc.) has been zoned for future development (residential, commercial, or industrial). Though no proposed plans have been accepted, it is highly likely that these areas are being prepared for development.

Transportation Improvement Projects (Cumulative): INDOT and/or local transportation improvements planned in or near the project area include:

- Northbound ramp from US 431 to 146th Street;
- Widening Keystone Avenue (SR 431) from four lanes to six lanes from I-465 to US 31;
- Construction of a new four-lane local roadway, Illinois Street, from 103rd Street to 136th Street;
- Widening 116th Street from two lanes to four lanes from Rangeline Road to Moontown Road;
- Widening 126th Street from two lanes to four lanes from Pennsylvania Street to Adams Street;

- Widening Old Meridian from two lanes to four lanes from Pennsylvania Street to Guilford;
- Programmed widening of SR 32 from US 31 to 1.6 miles west of US 31 from two lanes to four lanes; and
- Placeholder for increased capacity along SR 32 from US 31 to 2.6 miles east of US 31 (Moontown Road) from two lanes to four lanes.

5.20.2 Analysis

The study corridor was investigated from 96th Street to 216th Street along the existing alignment (Alternatives F1 through F6) and along the off-alignment area east of the Town of Westfield (Alternatives G1 through G6). The investigation included a review of existing road maps, aerial photographs, zoning maps, planning documents, and development plans as well as on-site reconnaissance. The timeframe for the analysis of development trends is from 2000 (the beginning of the project) to 2020 (Clay and Washington Township Comprehensive Plans). The following documents were reviewed for purposes of the Indirect and Cumulative Analysis:

- *Interim Report, Environmental Issues: INDOT US 31 Improvement Project.* (September 10, 2001) US 31 Carmel/Clay Task Force.
- *The Case for Context Sensitive Design for the US 31 Improvement Project through Hamilton County.* (Winter 2002) US 31 Carmel/Clay Task Force.
- *State Road 431 Environmental Assessment*. (November 2001) INDOT
- *Special Study Areas Report*. (July 10, 2001) Land Use Committee, Westfield/Washington Township Plan Commission
- *Town of Westfield & Washington Township Zoning Ordinance*. (January 2001) Town of Westfield, Indiana
- *Meridian Corporate Corridor* (brochure). Hamilton County Alliance
- *Carmel/Clay 2020 Vision Planning Process.* (1996) City of Carmel/Clay Township
- *Carmel Clay Land Use Regulations.* (September 17, 1999) City of Carmel/Clay Township
- *Westfield/Washington Township 2020 Comprehensive Plan.* (August 2, 1999, Draft Plan) Town of Westfield/Washington Township
- *Comprehensive Plan Update.* (1991) City of Carmel/Clay Township
- *Indiana Farm Land Use History: Hamilton County, Indiana.* (February 1999) Indiana Agricultural Statistics Service
- *US 31 Major Investment Study: Hamilton County, Indiana.* (March 1997) INDOT
- *http://www.co.hamilton.in.us* (Last accessed: January 25, 2003) Hamilton County, Indiana Government Website
- Historic aerial photography. Indiana State Land Office, Indiana University-Purdue University Indianapolis Electronic Atlas, Center for Advanced Applications in GIS
- http://www.carmelchamber.com (Last accessed: April 28, 2003) Carmel Clay Chamber of Commerce website

Carmel/Clay Township

Clay Township has experienced tremendous growth in recent years. From 1971 to 1995, developed land uses (residential, office/retail, public/semi public, and industrial/ manufacturing) have increased. In response, agricultural land uses have declined (Figures 4.3-1 and 4.3-2). The area from 96th Street north along the existing alignment (combined build alternatives) to 146th Street is heavily developed. All vacant properties in this portion of the study area are either under development, planned for development, or zoned for development. Land use trends along the corridor reveal an increase in development. The Carmel/Clay comprehensive plan states that "(h)igh intensity office development shall be encouraged to locate in the US 31 Corridor community/regional employment areas" (*Carmel/Clay 2020 Vision Planning Process*, pg 5-15 § 2.3.2). By the year 2015, the US 31 Corridor is projected to account for more than 16% of the total acreage in Clay Township.

96th Street to 106th Street

The lots in the northern corners of the intersection of 96th Street and US 31 (east and west) are former gas station locations. The vacant area in the northwest quadrant of 96th Street and US 31 is the future site of Parkwood West, a multi-building office complex with two parking garages. The agricultural parcels northeast of 96th Street and US 31 are zoned commercial (OM/M). The vacant parcel northwest of the intersection of I-465 and US 31 is zoned residential (S-2). The Heart Center of Indiana was recently completed in the southwest corner of the intersection of 106th Street and US 31, north of the Thompson Electronics complex.

106th Street to 116th Street

The vacant lots on either side (east and west) of US 31, north of 106th Street, are both zoned for business development (B-5). The western portion of the vacant lot on the west side of US 31 is zoned residential (S-2). The wooded lots north of 111th Street on either side of US 31 are zoned for business development (B-6). The vacant parcels on 111th Street beyond the wooded lots, to the west and east, are zoned residential (S-2 and R-1, respectively).

116th Street to 126th Street

The vacant agricultural/wooded lot in the northwest corner of 116th Street and US 31 is identified by the Hamilton County Alliance as being "slated for a planned development concept with the expectation that the site will incorporate office, commercial, and residential elements." The parcel is currently zoned business (B-6) along the corridor and residential (S-2) off the corridor. The wooded parcel southeast of the intersection of Old Meridian Street and US 31 is zoned for business (B-6). The vacant lot east of this wood lot, across North Pennsylvania Street, is zoned for industry (M-3) and residential (R-1). The wooded and agricultural lot on the west side of US 31, at the point of the Old Meridian Street intersection, is zoned for business (B-6 and B-3) and residential (S-2).

126th Street (Carmel Drive) to 136th Street

The agricultural property northeast of the intersection of 126th Street and US 31 is currently zoned for business (B-2). The northern portion of this parcel is planned for the future location of Hilton Gardens Inn, located in the southeast corner of the intersection of 131st

Street and US 31. The wooded lot southeast of the intersection of North Pennsylvania Street and 131st Street, east of US 31, is zoned multi-family residential (OM/MF) as part of the Old Meridian District. Hamilton Crossing, located in the southwest corner of the intersection of 131st Street and US 31 is an existing office complex that is still undergoing development. Buildings #1 through #4 are operational. Building #5 is being completed while construction of Building #6 is pending. A business park is planned for the northwest corner of the intersection of US 31 and 131st Street. The vacant parcel northeast of the proposed business park, along US 31, is zoned residential (S-2). The vacant lots northeast of the intersection of 131st Street and US 31 are zoned residential (S-2) and special use (OM/SU). At this point, US 31 turns to an east-northeast orientation. The vacant scrub-shrub lot along the north side of the corridor is zoned business (B-5). The St. Vincent Carmel Hospital, located in the southeast quadrant of the intersection of US 31 and 136th Street (Smokey Row Road)/Old Meridian Street, has recently expand to the south and west.

136th Street to 146th Street

The wooded lot located southeast along where 136th Street (Smokey Row Road) turns to the southwest, merging with Old Meridian Street, is zoned business (B-6). Residential and commercial developments line the corridor along US 31 to the Monon Trail (which will not be impacted by the project). The vacant parcel east of where the Monon Trail crosses US 31 is zoned residential (R-1). US 31 resumes a northerly course at this point. The large vacant scrub-shrub and wooded lot located southwest of 146th Street and US 31 is all part of the proposed Clay Terrace commercial development. A northbound ramp connecting US 431 (Keystone Avenue) to 146th Street, east of the US 31 corridor, is under construction. Finally, the parcel southeast of 146th Street and US 31 was recently occupied by Lowes.

Westfield/Washington Township

The US 31 Corridor is slightly less developed through Washington Township, particularly from 151st Street north to 169th Street and north of the Westfield/Washington Township school complex to 216th Street. Both of these areas have been identified by the Westfield-Washington Township Plan Commission as "Preferred Growth Areas," defined as "areas where future growth over the next 20 years is encouraged to occur" (*Westfield/Washington Township 2020 Comprehensive Plan*). The areas east of Westfield (Alternatives G1 through G6) are within this category as well.

146th Street to 156th Street (F and G Alternatives)

The area from 146th Street to the north side of 151st Street comprises the Westfield commercial district. There are no undeveloped properties in the commercial district. The wooded area northeast of the intersection of 151st Street is part of Cool Creek Park, which extents north to 156th Street. The properties affronting the east side of US 31 north of the commercial district are occupied by a doctor's office and Habig Garden Center, both zoned business (LB). A Seventh Day Adventist Church and its parsonage are located on the west side of US 31, north of the commercial district. The vacant properties along this side of the highway, extending north to 156th Street, are zoned agricultural (AG-SF1).

Alternatives F1 through F6 Analysis

The F Alternatives follow the existing US 31 Corridor from 156th Street north to 216th Street. As the route passes through the west side of Westfield, development is dense and built-up to the existing right-of-way. The area north of Westfield is rural with little existing development.

156th Street to 161st Street (Alternatives F1 through F6)

The east side of the US 31 corridor from 156th Street to 161st Street is mostly vacant, wooded properties; however, the entire area is zoned business (LB) from the highway east to Westfield Boulevard. The properties on the east side of Westfield Boulevard are residential. The vacant properties on the west side of US 31 are zoned agricultural (AG-SF1). However, these parcels are proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for medium density residential.

161st Street to SR 32 (Alternatives F1 through F6)

The Cool Creek Commons Commercial Development is planned for the northeast quadrant of the intersection of 161st Street and US 31. The wooded parcels, adjacent the proposed development, are zoned residential (SF-2) northward to the existing residences. The vacant properties north from the existing residences, beyond 169th Street, to approximately Grassy Branch stream are zoned business (GB-PD). North of Grassy Branch stream, the unoccupied parcels are zoned industrial (EI). The agricultural parcel northwest of the intersection of 161st Street and US 31 is zoned for residential development (SF-2). The wooded and agricultural parcels immediately west of this location are zoned agricultural (AG-SF1). However, these parcels are proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for medium density residential. The remaining vacant parcels on the west side of US 31, north to SR 32, are zoned for industrial development (EI).

SR 32 to 191st Street (Alternatives F1 through F6))

The US 31 corridor from SR 32 north to 181st Street is currently developed; the east side is commercial/industrial and the west side is predominantly public schools and residential. Development along the east side of the corridor continues north to 191st Street. The northwest corner of the intersection of US 31 and 181st Street is a commercial development. North Glenn Village is to the north, along the highway. All vacant properties adjacent to the highway to the north of North Glenn Village are zoned for business development (GB). The vacant field along the east side of Tomlinson Road, west of US 31, is zoned for agricultural production (AG-SF1). However, this parcel is proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for light intensity commercial.

191st Street to 203rd Street (Alternatives F1 through F6)

The agricultural field in the northeast corner of the intersection of US 31 and 191st Street is zoned industrial (EI) up to Cool Creek. The vacant parcels north, from Cool Creek to 202nd Street, are zoned agricultural (AG-SF1). The agricultural field located in the northwest corner of the intersection of US 31 and 191st Street is zoned for business development (GB-PD) up to Cool Creek. The vacant properties up to and west of the former water park are zoned agricultural (AG-SF1). The water park and the northerly adjacent agricultural field are

zoned business (GB-PD). The agricultural and wooded properties in the southwest corner of US 31 and 203rd Street are part of an area proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for light intensity commercial.

203rd Street to 216th Street (Alternatives F1 through F6)
The parcels in the southeast corner of US 31 and SR 38 are zoned for residential development (SF1) south to Lindley Ditch. The vacant properties along the west side of US 31 north to SR 38 are part of the area proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for light intensity commercial. All other vacant properties along the corridor, both east and west, are zoned for agriculture (AG-SF1).

Alternatives G1 through G6 Analysis
The G Alternatives follow a new alignment that deviates from the existing US 31 facility north of 156th Street. The route bypasses Westfield to the east, roughly paralleling Grassy Branch Road from SR 32 to 191st Street. Turning northeast, the route then rejoins the existing US 31 facility in the proximity of SR 38. The majority of the route is currently undeveloped.

156th Street to 161st Street (Alternatives G1 through G6)
The east side of the US 31 corridor from 156th Street to 161st Street is mostly vacant, wooded properties; however, the entire area is zoned business (LB) from the highway east to Westfield Boulevard. The properties on the east side of Westfield Boulevard are residential. The vacant properties on the west side of US 31 are zoned agricultural (AG-SF1). However, these parcels are proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for medium density residential.

161st Street to Oak Road (Alternatives G1 through G6)
The Cool Creek Commons Commercial Development is planned for the northeast quadrant of the intersection of 161st Street and US 31, extending east to Westfield Boulevard. The wooded parcels, adjacent the proposed development, are zoned residential (SF-2) northward to the existing residences. All vacant parcels within the study area east of Westfield Boulevard to Oak Road are zoned agricultural (AG-SF1). However, these parcels are proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for low density residential.

Oak Road to SR 32 (Alternatives G1 through G6)
The parcels within the project area east of Oak Road to Carey Road are part of the proposed Oak Manor Planned Unit Development (PUD). South of the Oak Manor PUD, along Oak Road, is the Oak Manor residential development, currently under construction. From Carey Road, the route turns northward to US 32. The central portion of the proposed Oak Manor PUD extents within and along both sides of the alignment of the alternative, north to US 32. The areas to the east and west of the PUD and south of SR 32 are zoned for business development (GB-PD and LB).

SR 32 to 191st Street (Alternatives G1 through G6)
The northeast corner of Grassy Branch Road and SR 32 is zoned for business development (LB-PD), extending to the east, along SR 32, to the existing cemetery. The vacant properties north of the cemetery and east of Grassy Branch Road are zoned agricultural (AG-SF1) north to 186th Street. However, these parcels are proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for low density residential. All of the vacant properties within a one square mile area centered on the intersection of Grassy Branch Road and 191st Street (extending from 186th Street north to 196th Street) are zoned residential (SF-2).

191st Street to 203rd Street (Alternatives G1 through G6)
The aforementioned residential zoning extends north to 196th Street and west to Flippins Road. Other than a small section of agricultural field centered between 196th Street and 202nd Street, along the east side of the proposed route (zoned business-GB), all vacant properties along the alternative from 196th Street to 202nd Street, to the east side of the US 31 facility, are zoned agricultural (AG-SF1). However, these parcels, as well as the agricultural and wooded properties in the southwest corner of US 31 and 203rd Street, are part of an area proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for light intensity commercial.

203rd Street to 216th Street (Alternatives G1 through G6)
The parcels in the southeast corner of US 31 and SR 38 are zoned for residential development (SF1) south to Lindley Ditch. The vacant parcels along the west side of US 31 from 203rd Street north to SR 38 are part of the area proposed in the *Westfield/Washington Township 2020 Comprehensive Plan* for light intensity commercial. All other vacant properties along the corridor, both east and west, are zoned for agriculture (AG-SF1).

The Carmel/Clay Township Plan Commission has identified the US 31 Corridor as a "community/regional employment area." Development of vacant properties is being actively encouraged in this area. All vacant properties have either been planned or zoned for future development. Based on land use trends and planning initiatives, it is likely that development would occur along the US 31 Corridor through Carmel/Clay Township regardless of the US 31 Improvement Project (Cumulative Impacts). Therefore, there are no identified Indirect Impacts in this portion of the corridor.

The Westfield/Washington Township Plan Commission has identified the US 31 Corridor as an "Urban Design Overlay Zone." The *Westfield/Washington Township 2020 Comprehensive Plan* proposes development along the corridor throughout the township north to SR 38. Alternatives F1 through F6 would be located entirely within this urban zone. The entire east side of Washington Township and along the west side of the existing US 31 corridor have been identified for proposed development, from 146th Street north to SR 38. Zoning for much of this area has been aligned with proposed future development. The limited area of impact north of SR 38 is not zoned for development; however, the area northeast of US 31 and SR 38 is planned for MacGregor Park. Therefore, identified Indirect Impacts in this portion of the corridor are limited to northwest of SR 38.

5.20.3 Historic Impacts Per Resource

Historic impacts to natural resources (forests, wetlands, streams, and farmland) were analyzed per resource based on available documentation of historic impact activity (Table 5.20-1). Historic reference to resource impacts varies per resource; therefore, the timeframe of the resource impact analysis is dependent on historic resource documentation.

Forests
Information regarding forests is limited to countywide data. According to the Indiana Agricultural Statistics Service (Figure 4.5-1), forested acreage in Hamilton County has been fairly stable since 1987. The earliest record of forested land observations in Hamilton County was during the Quaker settlement of Washington Township in 1831 when the area was described as "heavily wooded" (Lantzer, J. S., *The Transformation of Hamilton County's Washington Township, 1830-1860*). The earliest record of forested acreage in Hamilton County (2,270 acres) is from the 1930 US Census of Agriculture. From 1930, forest acreage increased to 6,155 acres, by 1978. Residential and commercial development increased in the early 1980's, bringing forested acreage in Hamilton County down to 4,076. In 1987, there were 4,854 acres of forest. These represent mostly fragmented wood lots scattered throughout the county. Impacts to forested properties have been minor since 1987, representing a net loss of 7% from 1987 to 1997. This is in stark contrast to the period from 1974 to 1987 which witnessed a net loss of 27% forested acres.

Wetlands and Streams
Data regarding wetland and stream impacts in Hamilton County are maintained by IDEM, Office of Water Quality, Planning and Restoration Branch as part of the Section 401 Water Quality Certification Program. These include impacts to both "waters of the US" (streams and wetlands that are contiguous to navigable waters) and isolated wetlands. Hamilton County is ranked forth in the State of Indiana for issuance of Water Quality Permits (WQPs) that result in compensatory mitigation (ranked behind Lake, Porter and Allen counties). Records of WQPs for Hamilton County date to 1986. Since that time, there have been 254 WQPs filed in Hamilton County. Approximately 67% (171) of these permits have been in reference to projects on and around Morse and Geist reservoirs. Of the remaining 83 WQPs, 41% (34) have been for projects within the study area of the US 31 Improvement Project. This comprises the largest concentration of WQPs issued in Hamilton County (minus Morse and Geist reservoirs).

Farmland
Information regarding farmland acreage is based on Hamilton County data. The earliest record of amount of land in farms is from 1900 (243,105 acres) in the US Census of Agriculture (Figure 4.5-1). From 1900 to 1997 (the most recent data), there has been a net loss of 42% total acreage of farmland in Hamilton County. The most significant loss of total farmland acreage occurred in the most recent published census period (1992 to 1997), with a net loss of 13% total farmland acreage. Local data concerning loss of farmland acreage is limited to Clay Township; where, from 1971 to 1995, there was a net loss of 60% total farmland acreage.

5.20.4 Conclusions

The City of Carmel/Clay Township and the Town of Westfield/Washington Township have experienced significant growth in recent years. Planning documents from both these communities indicate continued growth through at least the year 2020. Recent, proposed, and potential development accounts for the majority of vacant parcels within the project area. Only the northwestern-most portion of the proposed build alternatives is vacant with no indication of development. Cumulative Impacts are exponentially greater than Direct Impacts, which are proportionately larger than Indirect Impacts (Table 5.20-1). Cumulative Impacts to wetlands are similar for both alternatives. Cumulative Impacts to forests are slightly greater for Alternatives F1 through F6. Prime farmland Cumulative Impacts are greater for Alternatives G1 through G6. Impacts to streams (cumulative, indirect, and direct) are greater for Alternatives G1 through G6 as well.

Table 5.20-1
Indirect and Cumulative Impacts by Resource

Resource		Cumulative Impacts				Indirect Impacts[4] Total	Direct Impacts[5] Total
		Recent[1]	Proposed[2]	Potential[3]	Total		
Forest*	F Alternatives	0	55	392	447	1	32 - 39
	G Alternatives	0	42	390	432	1	84 - 91
Wetland*	F Alternatives	2	5	18	25	0	2 - 4
	G Alternatives	2	5	18	25	0	8 - 10
Prime Farmland*	F Alternatives	7	25	693	725	20	95 - 98
	G Alternatives	34	39	857	930	20	277 - 280
Streams †	F Alternatives	665	878	26,470	28,013	284	3,165 - 3,258
	G Alternatives	665	1,115	27,871	29,651	395	5,272 - 5,365

Sources: Hamilton County Plan Commission, Hamilton County Alliance
* Measured in acres
† Measured in linear feet
[1] Development that has been recently completed or is currently under construction
[2] Areas of proposed development with existing site plans
[3] Undeveloped land (agricultural or natural) that is zoned for development, but for which no proposed plans exist.
[4] Undeveloped land zoned agricultural where future development, inspired by the project, is likely
[5] Acreage immediately impacted by construction of US 31 improvements